a.) Amendments to the Claims

1. (Currently Amended) ~~A~~ An isolated multipotential stem cell which has been isolated from ~~a adult~~ an adult bone marrow, and which ~~differentiates~~ can differentiate into ~~at least~~ each of a cardiomyocyte, an adipocyte, a skeletal muscle cell, an osteoblast, and a vascular endothelial cell.

Claims 2-5 (Canceled)

6. (Currently Amended) The cell according to claim 1, wherein the cell is a multipotential stem cell which ~~further differentiates~~ can differentiate into each of a cardiomyocte, an adipocyte, a skeletal muscle cell, an osteoblast, a vascular endothelial cell, a nervous cell, and a hepatic cell.

7. (Previously Presented) The cell according to claim 1, wherein the cell is a multipotential stem cell which differentiates into any cell in adult tissues.

8. (Previously Presented) The cell according to claim 1, wherein the cell is CD117-positive and CD140-positive.

9. (Original) The cell according to claim 8, wherein the cell is further CD34-positive.

10. (Original) The cell according to claim 9, wherein the cell is further CD144-positive.

11. (Previously Presented) The cell according to claim 9, wherein the cell is further CD144-negative.

12. (Previously Presented) The cell according to claim 8, wherein the cell is further CD34-negative.

13. (Original) The cell according to claim 12, wherein the cell is further CD144-positive.

14. (Original) The cell according to claim 12, wherein the cell is further CD144-negative.

15. (Original) The cell according to claim 10, wherein the cell is further CD14-negative, CD45-negative, CD90-negative, Flk-1-negative, CD31-negative, CD105-negative, CD49b-negative, CD49d-negative, CD29-positive, CD54-negative, CD102-negative, CD106-negative, and CD44-positive.

16. (Original) The cell according to claim 11, wherein the cell is further CD14-negative, CD45-negative, CD90-negative, Flk-1-negative, CD31-negative, CD105-

negative, CD49b-negative, CD49d-negative, CD29-positive, CD54-negative, CD102-negative, CD106-negative, and CD44-positive.

17. (Original) The cell according to claim 12, wherein the cell is further CD14-negative, CD45-negative, CD90-negative, Flk-1-negative, CD31-negative, CD105-negative, CD49b-negative, CD49d-negative, CD29-positive, CD54-negative, CD102-negative, CD106-negative, and CD44-positive.

18. (Original) The cell according to claim 13, wherein the cell is further CD14-negative, CD45-negative, CD90-negative, Flk-1-negative, CD31-negative, CD105-negative, CD49b-negative, CD49d-negative, CD29-positive, CD54-negative, CD102-negative, CD106-negative, and CD44-positive.

19. (Original) The cell according to claim 1, which does not take up Hoechst 33342.

20. (Previously Presented) A cardiomyocyte precursor which differentiates into only cardiomyocyte induced from the cell according to claim 1.

21. (Previously Presented) The cell according to claim1, which differentiates into a ventricular cardiac muscle cell.

22. (Previously Presented) The cell according to claim 1, which differentiates into a sinus node cell.

23. (Previously Presented) The cell according to claim1, wherein the bone marrow is derived from a mammal.

24. (Original) The cell according to claim 23, wherein the mammal is selected from the group consisting of a mouse, a rat, a guinea pig, a hamster, a rabbit, a cat, a dog, a sheep, a swine, cattle, a goat and a human.

25. (Previously Presented) The cell according to claim 1, which is mouse bone marrow-derived multipotential stem cell BMSC (FERM BP-7043).

26. (Previously Presented) The cell according to claim 1, which differentiates into a cardiomyocyte by demethylation of a chromosomal DNA of the cell.

27. (Original) The cell according to claim 26, wherein the demethylation is carried out by at least one selected from the group consisting of demethylase, 5-azacytidine, and dimethyl sulfoxide, DMSO.

28. (Original) The cell according to claim 27, wherein the demethylase comprises the amino acid sequence represented by SEQ ID NO:1.

29. (Previously Presented) The cell according to claim 1, wherein the differentiation is accelerated by a factor which is expressed in a cardiogenesis region of a fetus or a factor which acts on differentiation into a cardiomyocyte in a cardiogenesis stage of a fetus.

30. (Original) The cell according to claim 29, wherein the factor which is expressed in a cardiogenesis region of a fetus or the factor which acts on differentiation into a cardiomyocyte in a cardiogenesis stage of a fetus is at least one selected from the group consisting of a cytokine, an adhesion molecule, a vitamin, a transcription factor, and an extracellular matrix.

31. (Original) The cell according to claim 30, wherein the cytokine is at least one selected from the group consisting of a platelet-derived growth factor, PDGF; a fibroblast growth factor-8, FGF-8; an endothelin 1, ET1; a midkine; and a bone morphogenetic factor, BMP-4.

32. (Original) The cell according to claim 31, wherein the PDGF, FGF-8, ET1, midkine, and BMP-4 comprise the amino acid sequence represented by SEQ ID NO:3 or 5, the amino acid sequence represented by SEQ ID NO:64, the amino acid sequence represented by SEQ ID NO:66, the amino acid sequence represented by SEQ ID NO:68, and the amino acid sequence represented by SEQ ID NO:70, respectively.

33. (Original) The cell according to claim 30, wherein the adhesion molecule is at least one selected from the group consisting of a gelatin, a laminin, a collagen, and a fibronectin.

34. (Original) The cell according to claim 30, wherein the vitamin is retinoic acid.

35. (Original) The cell according to claim 30, wherein the transcription factor is at least one selected from the group consisting of Nkx2.5/Csx, GATA4, MEF-2A, MEF-2B, MEF-2C, MEF-2D, dHAND, eHAND, TEF-1, TEF-3, TEF-5, and MesP1.

36. (Original) The cell according to claim 35, wherein the Nkx2.5/Csx, GATA4, MEF-2A, MEF-2B, MEF-2C, MEF-2D, dHAND, eHAND, TEF-1, TEF-3, TEF-5, and MesP1 comprise the amino acid sequence represented by SEQ ID NO:9, the amino acid sequence represented by SEQ ID NO:11, the amino acid sequence represented by SEQ ID NO:13, the amino acid sequence represented by SEQ ID NO:15, the amino acid sequence represented by SEQ ID NO:17, the amino acid sequence represented by SEQ ID NO:19, the amino acid sequence represented by SEQ ID NO:21, the amino acid sequence represented by SEQ ID NO:23, the amino acid sequence represented by SEQ ID NO:25, the amino acid sequence represented by SEQ ID NO:27, the amino acid sequence represented by SEQ ID NO:29, and the amino acid sequence represented by SEQ ID NO:62, respectively.

37. (Original) The cell according to claim 30, wherein the extracellular matrix is an extracellular matrix derived from a cardiomyocyte.

38. (Previously Presented) The cell according to claim 1, wherein the differentiation is inhibited by a fibroblast growth factor-2, FGF-2.

39. (Original) The cell according to claim 38, wherein the FGF-2 comprises the amino acid sequence represented by SEQ ID NO:7 or 8.

40. (Previously Presented) The cell according to claim 1, which differentiates into a cardiomyocyte or a blood vessel by transplantation into a heart.

41. (Previously Presented) The cell according to claim 1, which differentiates into a cardiac muscle by transplantation into a blastocyst or by co-culturing with a cardiomyocyte.

42. (Previously Presented) The cell according to claim 1, which differentiates into an adipocyte by an activator of a nuclear receptor, PPAR-g.

43. (Original) The cell according to claim 42, wherein the activator is a compound having a thiazolidione skeleton.

44. (Original) The cell according to claim 43, wherein the compound is at least one selected from the group consisting of troglitazone, pioglitazone, and rosiglitazone.

45. (Previously Presented) The cell according to claim 1, which differentiates into a nervous cell by transplantation into a blastocyst or by transplantation into an encephalon or a spinal cord.

46. (Previously Presented) The cell according to claim 1, which differentiates into a hepatic cell by transplantation into a blastocyst or by transplantation into a liver.

47. (Previously Presented) A method for differentiating a cell into a cardiac muscle, comprising selecting a cell according to claims 1 or 6-28 and administering thereto a chromosomal DNA-dimethylating agent.

48. (Previously Presented) A method for redifferentiating the cell according to claim 9 into a cell which is CD34-negative, comprising selecting said cell and administering thereto a chromosomal DNA-dimethylating agent.

49. (Previously Presented) A method for redifferentiating a cell comprising

selecting a cell which is CD117-negative and CD140-positive, administering thereto a chromosomal DNA-dimethylating agent and obtaining a cell according to claim 8.

50. (Original) The method according to claim 48 or 49, wherein the chromosomal DNA-dimethylating agent is selected from the group consisting of a demethylase, 5-azacytidine, and DMSO.

51. (Original) The method according to claim 50, wherein the demethylase comprises the amino acid sequence represented by SEQ ID NO:1.

52. (Previously Presented) A method for differentiating a cell into a cardiac muscle comprising

selecting the cell according to any one of claims 1 or 6 to 28 and applying thereto a factor which is expressed in a cardiogenesis region of a fetus or a factor which acts on differentiation into a cardiomyocyte in a cardiogenesis stage of a fetus.

53. (Original) The method according to claim 52, wherein the factor which is expressed in a cardiogenesis region of a fetus or the factor which acts on differentiation into a cardiomyocyte in a cardiogenesis stage of a fetus is at least one selected from the group consisting of a cytokine,

an adhesion molecule, a vitamin, a transcription factor, and an

extracellular matrix.

54. (Original) The method according to claim 53, wherein the cytokine is at least one selected from the group consisting of a platelet-derived growth factor, PDGF; a fibroblast growth factor-8, FGF-8; an endothelin 1, ET1; a midkine; and a bone morphogenetic factor, BMP-4.

55. (Previously Presented) The method according to claim 54, wherein PDGF, FGF-8, ET1, midkine, and BMP-4 comprise the amino acid sequence represented by SEQ ID NOS:3 or 5, the amino acid sequence represented by SEQ ID NO:64, the amino acid sequence represented by SEQ ID NO:66, the amino acid sequence represented by SEQ ID NO:68, and the amino acid sequence represented by SEQ ID NO:70, respectively.

56. (Previously Presented) The method according to claim 53, wherein the adhesion molecule is at least one member selected from the group consisting of a gelatin, a laminin, a collagen, and a fibronectin.

57. (Original) The method according to claim 53, wherein the vitamin is retinoic acid.

58. (Previously Presented) The method according to claim 53, wherein the transcription factor is at least one member selected from the group consisting of

Nkx2.5/Csx, GATA4, MEF-2A, MEF-2B, MEF-2C, MEF-2D, dHAND, eHAND, TEF-1, TEF-3, TEF-5, and MesPl.

59. (Previously Presented) The method according to claim 58, wherein Nkx2.5/Csx, GATA4, MEF-2A, MEF-2B, MEF-2C, MEF-2D, dHAND, eHAND, TEF-1, TEF-3, TEF-5, and MesPl comprise the amino acid sequence represented by SEQ ID NO:9, the amino acid sequence represented by SEQ ID NO:11, the amino acid sequence represented by SEQ ID NO:13, the amino acid sequence represented by SEQ ID NO:15, the amino acid sequence represented by SEQ ID NO:17, the amino acid sequence represented by SEQ ID NO:19, the amino acid sequence represented by SEQ ID NO:21, the amino acid sequence represented by SEQ ID NO:23, the amino acid sequence represented by SEQ ID NO:25, the amino acid sequence represented by SEQ ID NO:27, the amino acid sequence represented by SEQ ID NO:29, the amino acid sequence represented by SEQ ID NO:62, respectively.

60. (Previously Presented) The method according to claim 53, wherein the extracellular matrix is an extracellular matrix derived from a cardiomyocyte.

61. (Previously Presented) A method for differentiating a cell into an adipocyte comprising selecting the cell according to any one of claims 1 or 6 to 28 and applying thereto an activator of nuclear receptor PPAR-γ.

62. (Original) The method according to claim 61, wherein the activator is a compound having a thiazolidione skeleton.

63. (Original) The method according to claim 62, wherein the compound is at least one selected from the group consisting of troglitazone, pioglitazone, and rosiglitazone.

Claims 64-77 (Canceled)

78. (Previously Presented) A method for specifically transfecting a wild-type gene corresponding to a mutant gene in a congenital genetic disease to a myocardium, comprising using the cell according to any one of claims 1 or 6 to 46 into which the wild-type gene corresponding to a mutant gene in a congenital genetic disease of a heart has been introduced.

79. (Previously Presented) A therapeutic agent for a heart disease, comprising, as an active ingredient, the cell according to any one of claims 1 or 6 to 46 into which a wild-type gene corresponding to a mutant gene in a congenital genetic disease of a heart has been introduced.

80. (Currently Amended) A method for producing an antibody ~~which specifically recognizes the~~ comprising selecting a cell according to any one of claims 1 or 6

to 46, ~~comprising~~ using the cell as an antigen and obtaining an antibody which specifically recognizes the cell.

81. (Previously Presented) A method for isolating a cell having the potential to differentiate into a cardiomyocyte according to any one of claims 1 or 6 to 46, comprising using an antibody obtained by the method according to claim 80.

82. (Previously Presented) A method for obtaining a surface antigen specific for the cell according to any one of claims 1 or 6 to 46, comprising using the cell.

83. (Previously Presented) A method for screening a factor which proliferates the cell according to any one of claims 1 or 6 to 46, comprising using the cell.

84. (Previously Presented) A method for screening a factor which induces the cell according to any one of claims 1 or 6 to 46 to differentiate into a cardiomyocyte, comprising using the cell.

85. (Previously Presented) A method for screening a factor which immortalizes the cell according to any one of claims 1 or 6 to 46, comprising using the cell.

86. (Previously Presented) A method for immortalizing the cell according to any one of claims 1 or 6 to 46, comprising expressing a telomerase in the cell.

87. (Original) The method according to claim 86, wherein the telomerase comprises the amino acid sequence represented by SEQ ID NO:31.

88. (Previously Presented) A therapeutic agent for a heart disease, comprising, as an active ingredient, the cell according to any one of claims 1 or 6 to 46 which has been immortalized by expressing a telomerase.

89. (Original) The therapeutic agent according to claim 88, wherein the telomerase comprises the amino acid sequence represented by SEQ ID NO:31.

90. (Previously Presented) A culture supernatant comprising the cell according to any one of claims 1 or 6 to 46.

91. (Previously Presented) A method for inducing a cell to differentiate into a cardiomyocyte, comprising selecting a cell according to any one of claims 1 or 6-46, and applying thereto a culture supernatant comprising any of said cells.